# Electronic Banking And Bank Performance In Nigeria

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## Abstract

*This study investigated the profitability performance of Nigerian banks following the full adoption of electronic banking system. The study became necessary as a result of increased penetration of electronic banking which has redefined the banking operations in Nigeria and around the world. Judgmental sampling method was adopted by utilizing data collected from four Nigerian banks. These four banks are the only banks in Nigeria that have consistently retained their brand names and remain quoted in the Nigerian Stock Exchange since 1997. The profitability performance of these banks was measured in terms of returns on equity (ROE) and returns on assets (ROA). With the data collected, we tested the pre- and post-adoption of e-banking performance difference between means using a standard statistical technique for independent sample at 5 percent level of significance for performance factors such as ROE and ROA. The study revealed that the adoption of electronic banking has positively and significantly improved the returns on equity (ROE) of Nigerian banks. On the other hand and on the contrary, it also revealed that e-banking has not significantly improved the returns on assets (ROA) of Nigerian banks.. The findings of this study have motivated new recommendations for bank customers, bank management and shareholders with regard to electronic banking adoption for banking operations.*

**Keywords:** Electronic banking, returns on assets (ROA), returns on Equity (ROE), difference between means and Bank profitability performance**.**

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## Introduction

The introduction of Universal banking practice in Nigeria and the adoption of electronic banking by Deposit Money banks have offered increased services to customers with attendant increase in customer risk exposure. The changing environment of bank management in Nigeria has impacted much on the number of services and risk which Nigerian banks face.

Electronic banking is the conduct of banking business electronically which involves the use of information communication technology to drive banking business for immediate and future goals. Daniel (1999) cited in Alhajri [1] describes

e-banking as the provision of banking services to customers through internet technology. According to Basel Committee on banking supervision[2], electronic banking is defined to include the provision of retail and small value banking products and services through electronic channels as well as a large value electronic payment and other wholesale banking services delivered electronically Though, Alsmadi and Al-wabel[3] expressed that the definition of electronic banking varies among researchers partially because electronic banking refers to several types of services through which bank customers can request information and carry out banking services..

However, the revolution in the banking industry in Nigeria started with the advent of electronic devices to assist in the discharge of quality services to bank customers. The introduction of these electronic devices has increased competition in the industry which has gone a long way to reducing customers' waiting time for banking transactions. This innovation is brought in by the use of computers and other networking gadgets. In Nigeria, the networking started with the LAN (Local Area Network) MAN (Metropolitan Area Network) and subsequently the WAN (Wider Area Network).

Generally, the automation of banks makes transaction and data processing very easily accessible for quick management decision making. This led to another level of benefit which ushered in what is today referred to as electronic banking. Electronic banking helps the banks to speed up their retail and wholesale banking services. The banking industry believes that by adopting the new technology – e-banking, the banks will be able to improve customer service level and tie their customers closer to the bank [4]. According to Simpson[5], what actually motivates the investment in electronic banking is largely the prospects of minimizing operating costs and maximizing operating revenue.

Nevertheless, the adoption of electronic banking (e-banking) has brought major challenges to the banking industry in terms of risk exposure. The volume of deposits has increased as well as the fraudulent practices experienced by Nigerian banks since its adoption in the economy. This is the reason why Ovia[6] posits that Nigeria's banking scene has witnessed phenomenal changes, especially in the mid 1980s and these have manifested in the enormous volume and complexity in product or service delivery, financial liberalization and business process re-engineering. The effectiveness of deploying information Technology in banks therefore can not be put to doubt. The fact remains that the reality of using IT in banks is necessitated by the huge amount of information being handled by these banks on a daily basis. On the customers' side, cash is withdrawn or deposited, cheques are deposited or cleared, statement of accounts are provided, money transfers etc. At the same time, banks need up-to-date information on accounts, credit facilities and recovery, interest, deposits, charges, income, profitability indices and other control of financial information.

However, researchers have not given much attention to this revolution occasioned by electronic banking with regard to profitability performance of banks.

The revolution in the banking industry in Nigeria occasioned by the adoption of electronic banking has compelled Nigerian banks to invest more in assets to meet up

with competitive positioning. Since much earnings have been retained to meet up this obligation, shareholders have been denied dividend with the expectation that future dividend will be fatter.

The banking software is usually improved on short term basis causing huge financial costs to the banks. To the capital providers, they expect that there would be tremendous returns accruing from the project if information driven technology (e-banking) is adopted. Going through annual financial reports of Nigerian banks in recent years, they reveal that dividend returns are dwindling while other performance indicators seem to be weak contrary to the expectation of the shareholders or investors. Generally, there appears not to be improvement on banks' returns on equity and assets as speculated.

This study tries to fill the gap and to complement previous literature available on electronic and internet banking in Nigeria. Although, there has been vast study on the benefits the banks customers will derive on adoption of electronic banking, there is however less research outputs in the area of returns on assets and returns on equity to investors. This study therefore investigates the pattern of returns on equity and assets of Nigerian banks in this era of e-banking.

## Review of Related Literature

In recent times, electronic banking has spread rapidly all over the globe. According to Onay e-t al [7], the increased adoption and penetration of internet has recently redefined the play ground for retail banks. In Nigeria, all banks are making greater use of e-banking facilities to provide better services in order to excel in the competitive Nigerian banking industry. The spread of e-banking has also greatly benefited the ordinary customer in general and corporate world in particular. Consequently, electronic banking (e-banking) has been the greatest challenge to the banking industry going by the sophistication and volume of fraudulent practices associated with this form of banking.

In the past few years, banking activities in Nigeria have increasingly depended on the deployment of information and communications technology. Customers' insatiable appetite for efficient services has compelled financial institutions to fast track to a more radical transformation of their business systems and models for embracing e-banking [6].

E-banking appeal as well its product development is rapidly growing, and the global acceptance has strongly encouraged its penetration. The success of e-banking is contingent upon reliable and adequate data communication infrastructure. Therefore, it is efficient for banks to invest in online transactions through the creation of networks. However, there has been a mix up between electronic banking and internet banking. The fact is that internet banking is subsumed in electronic banking.

Banking has come a long way from the time of ledger cards and other manual filing systems. Most banks today have electronic systems to handle their daily voluminous tasks of information retrieval, storage and processing. Irrespective of whether they are automated or not, banks by their nature are continually involved in all forms of information management on a continuous basis.

The computer is of course an established tool for achieving a competitive edge and optimal resource allocation. The most

obvious application of computers in the banking industry is in the area of customer services, information management and control. Computerized banks respond immediately to requests from customers for statement of accounts, balance and account activity enquiries. With signature and image verification systems, the time taken to offer typical cashier services like receiving and paying out of cash is minimized [8]. Also with the advent of automated Teller machines (ATM), banks are able to serve customers outside the banking hall all round the clock.

**Types and Delivery Channels of e-banking**

E-banking can be classified into three basic types. These include *Internet banking*, *Smart card banking* and *Mobile/telephone banking.*

**Internet banking**: This is a type of e-banking service where customers' instructions are taken and attended to through the internet. Internet banking offers customers the possibility of enjoying banking services from the comfort of their homes and offices. What this means is that customers can buy goods by placing orders from the net, instruct their banks to pay the vendor the invoice amount involved, and the products are delivered to the destination where the buyer wants.

**Smartcard banking**: This is the conduct of banking transactions through the use of electronic cards (Value Card, ATM Card, Debit Card, Credit Card etc.). The smart card system makes it easy for bank customers to have access to cash, carry out transfers and make enquiries about their accounts without visiting the banking hall. Smart card facility is usually mounted at strategic places in the cities such as supermarkets, Hotels, Transport terminals, shopping malls etc.

**Mobile/telephone banking**: This involves the conduct of banking business through the use of mobile phones or fixed wireless phones. It takes the following steps: Instructions are passed via voice or short messages (SMS) to the computer; the computer decrypts the message and executes the instructions through a highly coded device. Then, the response is given back to the customer electronically.

**Benefits of E-banking**

Rogers [9] posits that the rate of adoption of a new innovation is related to (perceived) relative advantage: The greater the perceived related advantage, the faster the adoption. Secondly, the desire to improve organizational performance is seen to be an enabler for technological change. However, the benefits of electronic banking encompass a broad range of functions and include: Electronic mail (e-mail) improves communication between individuals and the bank, within the bank, with the bank and external parties and between banks.

The availability of online information provides bankers and customers with a powerful vehicle for research. Banks can provide information and services online which customers can pay for and receive. Banking processes are made more efficient and cost effective by integrating other aspects of banking operations such as management and financial control. Ovia[6] posits that on-line banking services have now become a birth right of the customer as the customer demands the flexibility of operating an account in any branch of a bank irrespective of which branch the account

was domiciled. With internet banking, customers would enjoy sitting in the comfort of their homes and offices and with a Personal Computer, log onto their banks' servers and transact banking activities [6].

**Electronic Banking Risks and Control**

Each financial institution should apply guidelines based on its scope and level of sophistication in e-banking technology. Typically, electronic banking amplifies the scale of exposure of banks to traditional risks, such as transaction, strategic, reputation and compliance risk, among others. As information systems become more connected and interdependent, the risk of computer intrusion will increase. Arguably, this is the single most challenging aspect of the "new" electronic delivery system. Banks with weak physical and system security substantially increase their exposure to a plethora of risks, many of which could lead to collapse. Potential consequences include direct currency loss, change reputation, improper disclosure, and law suits or regulatory sanction. Bank consolidation as most Central Banks think, may not only be the solution to Bank distress and collapse. But exposure to global risk due to the adoption of electronic banking can in a moment throw a bank into oblivion. The security of payment cards from the view point of the holder is another area of concern. The danger of invasion of the system by fraudsters to corner and divert funds is ever present and a successful invasion could result in jumbo scale diversion of funds [10]. Another security problem of payment cards as noted by Okafor [10] is the consequence of any break down even momentarily and for whatever reasons, could be devastating. Therefore, banks deploying this technology should have an eagle eye to monitor occurrence of breakdown and good maintenance culture.

Therefore, e-banking should be consistent with the banks overall strategic and business plans, and adequate expertise should be employed to operate and maintain such systems. It is therefore imperative that e-banking risks be managed as part of a bank's overall risk management process. The level of risks assumed by banks need to be consistent with individual bank's overall risk tolerance, and not its ability to manage and control risk [11].

**Bank Performance**

By bank performance, generally it implies whether a bank has faired well within a trading period to realize its objectives. The only document that explains this is presumably the published financial statements. According to Rose [12], a fair evaluation of any bank's performance should start by evaluating whether it has been able to achieve the objectives set by management and stockholders. Certainly, many banks have their own unique objectives. Some wish to grow faster and achieve some long-range growth objective, others seem to prefer quiet life, minimizing risk and conveying the image of a sound bank, but with modest rewards to their shareholders [12]

Ordinarily, stock prices and its behaviour are deemed to reflect the performance of a firm. This is a market indicator and may not be reliable always. However, the size of the bank, the volume of deposit and its profitability could be deemed as more reliable performance indicators. For the purpose of this study, profitability indicators, precisely the Return on Equity

Capital (ROE) and the returns on Assets (ROA) are used to assess bank performance. These ratios are indicators of management efficiency, and rate of returns. According to Rose [12], these profitability measures vary substantially over time and from one banking market to another. The ROE and ROA are popularly in use today. Nikolai & Bazley[13] posit that the amount of net income earned in relation to total assets is an indicator of how efficiently a company uses its economic resources. They further stressed that when the ROE is higher than the ROA, the company has favourable financial leverage.

**Research Evidence**

Sullivan [14], in his study took sample of banks that are located in tenth Federal Reserve District that have adopted internet bank and those that have not. Comparing their financial performances and risk positions, he observed that the profitability and risks of these grouped banks were similar.

Hernando and Nieto [15] found that the impact of adopting internet on the performance of banks as a delivery channel of e-banking takes time to appear. They hold the view that the adoption of a transactional website has a positive impact on profitability which becomes significant in terms of ROA and ROE three years after adoption. This finding actually conveys that there is a lag period for positive profitability impact to manifest on adoption of electronic banking. However, their study revealed some weaker evidence of an earlier positive impact on adoption of e-banking particularly in terms of ROA.

Siam [16] citing the works of Shuqair (2003) on "practical electronic banking services by the Jordanian banks", pointed out that one of the most important findings in that study is the high cost of electronic banking services on the short run due to the training of employees, and the cost of the infrastructure. The implication of this finding is that electronic banking services will have a negative effect on the bank's profitability in the short run.

Onay et al [7], in their study reveal that adoption of online banking and its investment is a gradual process. They posit that electronic banking does not seem to have a significant impact on the performance of Turkish banks measured in terms of ROA, ROE or margin in the year of adoption of the technology. Further, they showed that in the following year, there was significant decrease in profitability which was also attributed to the increase in IT expenditure following the adoption of the new technology.

Also, in a similar study, Malhotra, and Singh [17], found that profitability and experience in offering of internet banking do not have any impact on banks' performance in the Indian banking context.

Khrawish and Al-sa'di[18] studied the impact of e-banking on bank profitability with evidence from Jordan. For banks that applied electronic services for less than two years, they found that there was no significant effect of these electronic services on the return of assets and the returns on equity. The study however, showed that such services made significant impact on the profit margin of the concerned banks. They also found that there was no significant effect of these services on banks profitability after two years of applying it in Jordan.

Alsmadi and Al-wabel [3], while studying e-banking on the performance of Jordanian

banks, found that the adoption of e-banking affects bank performance negatively. In their opinion, they hold that e-banking may eventually become a very important factor affecting performance for many banks. From the research evidence so far, there has not been a research output of related study from Nigeria on electronic banking and banks profitability performance since the adoption of electronic banking. This study therefore makes an insight in this direction to close the gap.

**Research Methodology**

This study utilizes secondary data extracted from the Nigerian Stock Exchange Fact Books and published annual reports of four sampled banks. With the secondary data collected, returns on assets and equity for the relevant years were computed. These four banks are banks that have continued to retain their brand names and still quoted in the Nigerian Stock Exchange since 1997. The data collected covers the period 1997-2010. Since the objective of the study has been to determine whether e-banking has significantly improved the profitability performance of banks in Nigeria with regards to the returns on equity (ROE) and returns on assets (ROA), the data was grouped into two i.e. pre and post adoption of electronic banking.

The years 1997-2002 covers the pre-adoption period and 2003- 2010 covers the post full adoption period of electronic banking in Nigeria.

Based on the above, the mean returns on assets and equity respectively for each bank was computed for the relevant years of the group data.

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The Return on Equity is given by:

$$ROE = \frac{\text{Net Income after taxes}}{\text{Total Equity capital}}$$

While Returns on Assets is given by:

$$ROA = \frac{\text{Net income after taxes}}{\text{Total Assets}}$$

Furthermore,

$$\frac{1}{\sum_{n=4}} \quad \frac{\Sigma \text{ BROE}}{\Sigma N} = \text{Mean for each bank} \qquad \text{Eqn. 1}$$

$$\frac{1}{\sum_{n=4}} \quad \frac{\Sigma \text{ BROA}}{\Sigma N} = \text{Mean for each bank} \qquad \text{Eqn. 2}$$

where:

BROE = Bank Returns on Equity
BROA = Bank Returns on Assets
N = Number of years

Based on the means computed for each bank, the test for difference between means was conducted to test how significant our results are at five percent (5%) level of significance. The test for difference between means is a standard statistical technique for testing independent samples.

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## 4.1 Data Presentation and Analysis

**Table 1:ROE (return on equity) Pre Adoption of E-banking**

$X_1, X_2 \ldots\ldots\ldots\ldots X_6$ = ROE for all sampled Banks for the relevant years

| | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | MEAN |
|---|---|---|---|---|---|---|---|
| BANK | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
| A | 0.18 | 0.20 | 0.28 | 0.31 | 0.28 | 0.22 | 0.245 |
| B | 0.21 | 0.21 | 0.30 | 0.39 | 0.37 | 0.16 | 0.273 |
| C | 0.17 | 0.04 | 0.23 | 0.43 | 0.14 | 0.14 | 0.192 |
| D | 0.36 | 0.33 | 0.16 | 0.20 | 0.24 | 0.20 | 0.248 |
| TOTAL | | | | | | | 0.958 |
| Mean of Means | | | | | | | 0.240 |

**Source:** Computed from Stock Exchange Fact book (various issues) and Annual reports on sampled banks for the relevant years

**Table 2: ROE (Return on Equity) Post Adoption of E-banking**

| | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ | **Mean** |
|---|---|---|---|---|---|---|---|---|---|
| BANK | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | |
| A | 0.41 | 0.29 | 0.27 | 0.26 | 0.24 | 0.09 | 0.10 | 0.05 | 0.214 |
| B | 0.20 | 0.22 | 0.24 | 0.10 | 0.13 | 0.22 | 0 | 0 | 0.139 |
| C | 0.22 | 0.23 | 0.26 | 0.24 | 0.12 | 0.21 | 0.07 | 0.01 | 0.170 |
| D | 0.12 | 0.03 | 0.32 | 0.10 | 0.11 | 0 | 0 | .0.02 | 0.090 |
| Total | | | | | | | | | **0.613** |
| Mean of Means | | | | | | | | | **0.153** |

$X_1, X_2 \ldots\ldots\ldots\ldots X_8$ = ROE for all sampled Banks for the relevant years

**Source:** Computed from Stock Exchange Fact books (various issues) and Annual reports on banks for the relevant years.

**Table 3:ROA (Return on Assets) Pre Adoption of E-banking**

| | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | **Mean** |
|---|---|---|---|---|---|---|---|
| BANK | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
| A | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.018 |
| B | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.020 |
| C | 0.02 | 0.00 | 0.01 | 0.03 | 0.01 | 0.01 | 0.013 |
| D | 0.02 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.022 |
| Total | | | | | | | **0.073** |
| Mean of means | | | | | | | **0.018** |

$X_1, X_2 \ldots\ldots\ldots\ldots X_6$ = ROA for all sampled Banks for the relevant years

**Source:** Computed from Stock Exchange Fact book (various issues) and Annual reports on sampled banks.

**Table 4: ROA (Return on Assets) Post Adoption of E-banking**

| | $X_1$ | $X_2$ | $X_3$ | $X_4$ | **X5** | **X6** | **X7** | **X8** | **Mean** |
|---|---|---|---|---|---|---|---|---|---|
| BANK | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | |
| A | 0.03 | 0.04 | 0.03 | 0.03 | 0.02 | 0.03 | 0.02 | 0.02 | 0.028 |
| B | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0 | 0.02 | 0.019 |
| C | 0.01 | 0.02 | 0.02 | 0.01 | 0.02 | 0.03 | .01 | 0.00 | 0.015 |
| D | 0.01 | 0.01 | 0.05 | 0.02 | 0.02 | 0 | 0 | 0.08 | 0.024 |
| Total | | | | | | | | | 0.097 |
| Mean of means | | | | | | | | | 0.024 |

$X_1, X_2 \ldots\ldots\ldots\ldots X_8$ = ROA for all sampled Banks for the relevant years

**Source:** Computed from Stock Exchange Fact books (various issues) and Annual reports of banks.

**Test for Difference Between Means**

$$t = \frac{\overline{X}_1 - \overline{X}_2}{s_{\overline{X}_1 - \overline{X}_2}}$$ Eqn. 3

where

$$s_{\overline{X}_1 - \overline{X}_2} = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}.$$ Eqn. 4

Here $s^2$ is the unbiased estimator of the variance of the two samples, $n_i$ = number of participants in group $i$, $i$=1 or 2. Note that in this case $s_{\overline{X}_1 - \overline{X}_2}^2$ is not a pooled variance.

$$\text{d.f.} = \frac{(s_1^2/n_1 + s_2^2/n_2)^2}{(s_1^2/n_1)^2/(n_1 - 1) + (s_2^2/n_2)^2/(n_2 - 1)}. \qquad \text{Eqn. 3}$$

**4.2 Empirical Results and Discussion.**

The test for difference between means were conducted for pre and post adoption of electronic banking for both returns on equity (ROE) and returns on Assets (ROA) at 5 Percent levels of significance. The results reveal that there is significant difference between pre and post returns on equity on adoption of electronic banking, hence t-calculated > $t_{.0.05}$ i.e. 2.767 > 2.571. The clearer picture of the results is that adoption of e-banking in Nigeria has significantly improved Nigerian banks performance in terms of returns on equity (ROE) only.

On the other hand, the results also reveal that there is no significant difference between pre- and post- returns on assets (ROA) of Nigeria banks on adoption of e-banking. Here, the implication of this result is that electronic banking adoption has not significantly improved the returns on assets of Nigerian banks. These tests for difference of means applied to test pre - and post-returns on adoption of the e-banking technology showed no positive impact of the e-banking technology on the profitability performance indicator measured as ROA, hence the t-calculated < $t\alpha_{0.05}$ .i.e. -.946 < 2.571.

Going by the activities of banks and their full integration into electronic banking system, the operations costs of banks have increased rapidly in relation to turnover. It is also a known fact that electronic banking technology is capital intensive which involves huge initial capital spending and associated maintenance costs. Consequently, electronic banking equipment has increased the total cost of assets of banks. As a result of the above, total asset returns being positive in the short run may not be feasible. It is expected that there should be lag period before positive returns on total assets are noticed.

The result of this study above is in line with those of Onay et al [7] that used Turkish banks to test the impact of internet banking on bank profitability. Their study revealed online banking as a gradual process, and further, provided evidence that internet banking variables have had a positive impact on the performance of the banking system in Turkey in terms of ROE only with a lag of two (2) years. Hernando and Nieto [15] in their study that used Spanish banks revealed positive impact of e-banking in the third year of adoption. This also conveys that there is a lag period for recovery of the huge capitalized costs. Siam [16] in a similar study discovered negative effect of electronic banking services using Jordanian banks in the short run. This he attributed to cost of investments by the banks to set up the technical and electronic infrastructure; train their employees to be skilled as well as

competent in this field and prepare what is called an electronic environment where banks can electronically operate smoothly. The result of this study also shares similar opinion of these scholars and hope that profitability level of performance may be better in the long run.

Nevertheless, the result of this study with respect to returns on total assets does not imply that electronic banking is not necessary nor is it an expenditure in futility. E-banking creates more bank products and has come a long way in satisfying customers' quest for improved financial service delivery. Customers can do banking transactions at their convenience; hence 24 hours are available for banking transactions. Electronic banking should increase efficiency and reduce wastage. It has led to expansion of the banking industry, opening new avenues for banking operations. Electronic banking has greatly helped banks to reduce paper work, thus helping them to operate in more reduced paperless environment. It has also discouraged many illegal and illegitimate practices associated with money laundering. E-banking has changed the dimensions of competition in deposit money banking by adding a new distribution channel to deposit money banking.

However, because one of the profitability performance indicators (ROA) examined in this study is yet to be improved, this study cannot conclude that electronic banking has generally improved profitability performance of banks in Nigeria. The unimproved returns on assets meanwhile may have arisen from the high cost of the technology and maintenance cost of software. It is a fact that e-banking facilities are still new with high cost of maintenance and updating of software as well as human capital. This may be the reason why Nikolai and Bazley[13] posited that the returns on company's assets will get higher as the assets become older because the denominator will decrease each year due to the increase in accumulated depreciation. Furthermore, since prices tend to increase arising from inflation, a company that uses recently purchased assets will tend to show relatively lower returns on these assets. As a case, Nigeria is a developing country, if the size of bank customers continues to grow in future; the returns on ROA and ROE will relatively improve significantly. This is to say in simple terms that the improvement expected on profitability will manifest in the long run. Also, Nigeria as a country meanwhile experience poor power supply for operations. The costs of generating energy for about 24 hours daily to operate computers and other electronic machines used in electronic banking activities are enormous. This is because people and corporate organizations resort to own generating set to augment epileptic power supply by the agency in charge of power supply in Nigeria - the PHCN. All these cause the operating costs to rise.

### 5.1 Summary, Conclusion and Recommendations:

This study investigated the returns on equity and returns on assets of Nigerian banks following the adoption of electronic banking in Nigeria. Nigeria is a developing country advancing in the use of electronic banking for its banking operations in comparison with others in African region. With high level of e-banking fraud, some customers feel discouraged with the use of

Automated Teller Machines (ATM), an electronic banking product.

This study has provided evidence that electronic banking has improved returns on the equity of Nigeria banks significantly but yet to positively improve the returns on assets (ROA) based on the hypotheses tested. As revealed by the empirical result on returns on assets, this study does not suggest that the adoption of e-banking is an investment in futility; rather it helps to satisfy customers' appetite for improved service delivery and convenience. The unimproved returns may have arisen from the high cost of maintenance of equipment, software and training of personnel. Electronic banking is cost intensive and will improve on total profitability performance in future as incidence of banking fraud caused by electronic facilities reduces and as well as the assets get older. The study encourages the use of electronic banking system based on its enormous benefits to the bank management, customers and the regulatory authorities.

This study therefore recommends as follows:

That the banking industry should adjust to full and effective deployment of information technology due to its sophistication since the technology is irreversible with relative perceived advantage.

That Nigerian banks should be able to accept the level of risk that they can cope with in electronic banking system, measurable to the bank's overall strategic and business plans. Though there is inherent risk for not adopting e-banking.

That banks should be able to provide adequate security both physically and electronically to check the incidence of hacking by fraudsters. Network hackers successfully dupe banks of billions of naira at a strike and can send banks into liquidation.

That holder of banking transaction cards should be able to secure them by providing passwords

Those are unimaginable by the most immediate neighbors at intervals but re-collectible at all times.

That shareholders of banks should exercise patience with the banks management in the payment of dividend as perceived future dividends will be fatter after some lag period of cost recovery.

That the banks management should from time to time train customers with regard to electronic banking, its benefits, risk exposure, physical and electronic security to avoid financial loss in the hands of hackers. Also, trainings should be held for bank staff in short periods to acquaint them with modern developments of the sophisticated technology in changing times.

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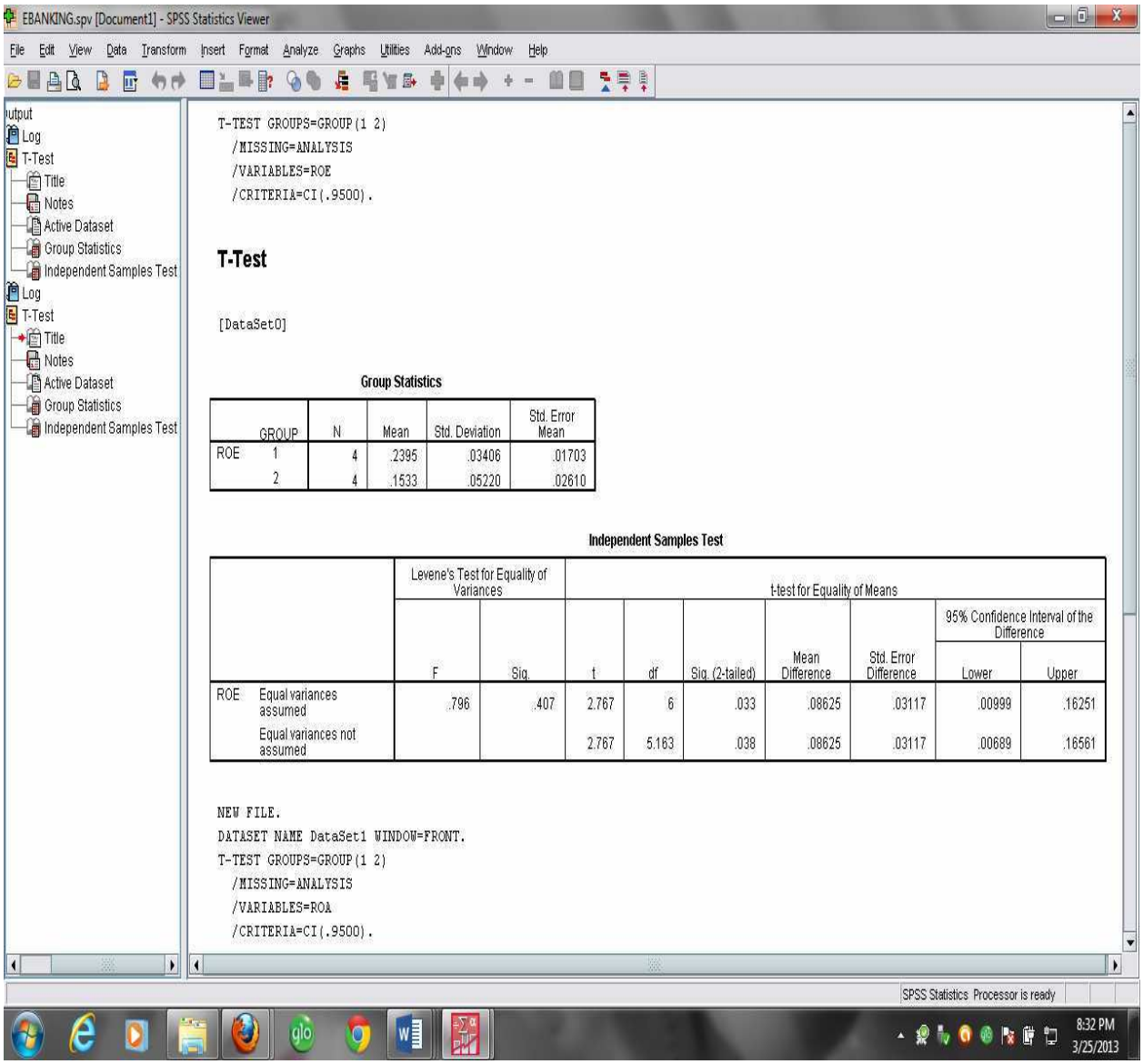
# Appendices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Title
Notes
Active Dataset
Group Statistics
Independent Samples Test
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Levene's Test for Equality of Variances
t-test for Equality of Means
95% Confidence Interval of the Difference
F Sig. t df Sig. (2-tailed) Mean Difference Std. Error Difference Lower Upper
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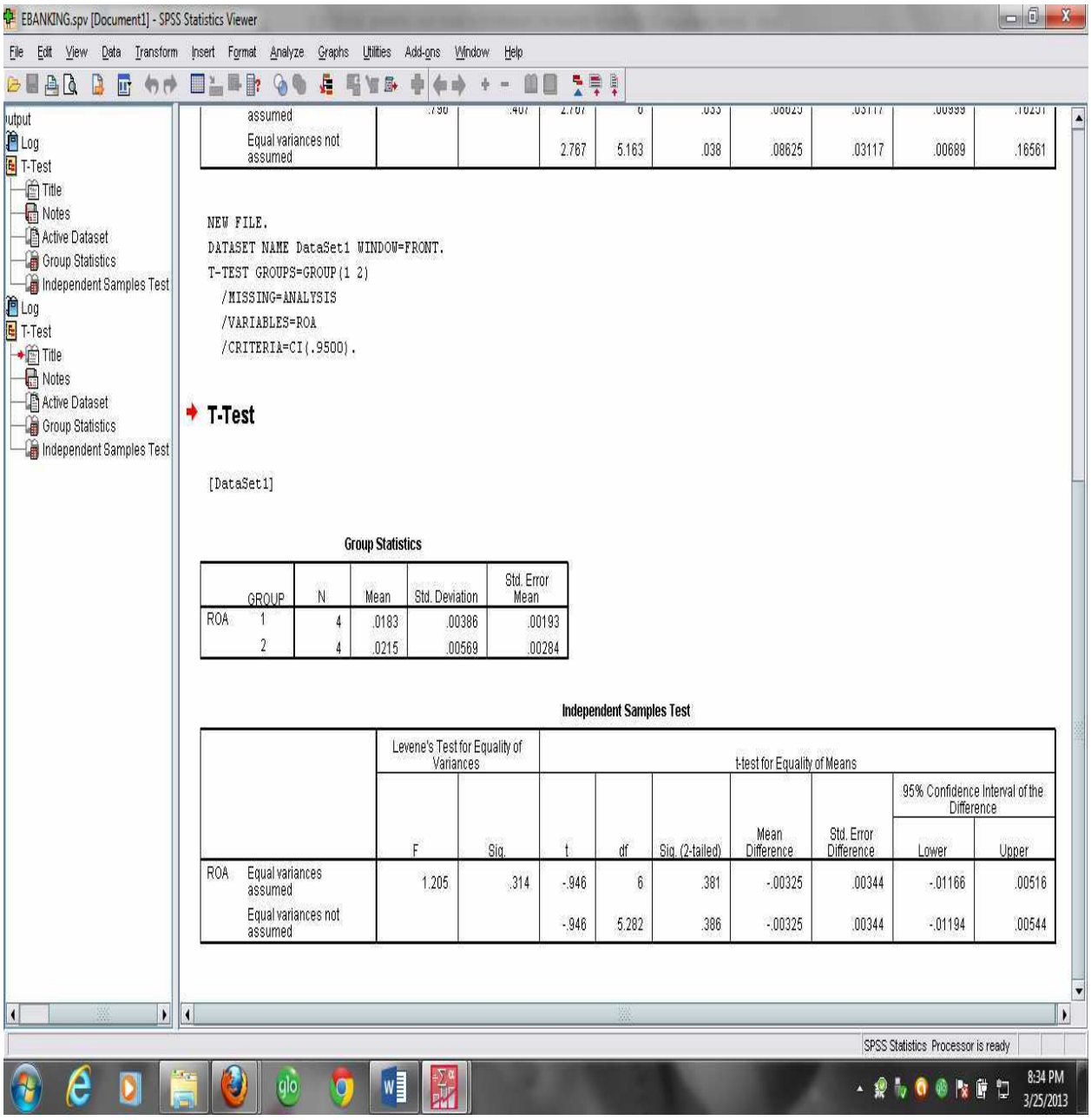
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Group Statistics
Independent Samples Test
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Independent Samples Test
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Levene's Test for Equality of Variances
t-test for Equality of Means
95% Confidence Interval of the Difference
F Sig. t df Sig. (2-tailed) Mean Difference Std. Error Difference Lower Upper
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Equal variances not assumed -.946 5.282 .386 -.00325 .00344 -.01194 .00544
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